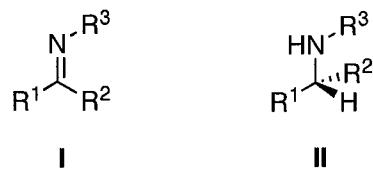


### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A process for the hydrogenation and/or asymmetric hydrogenation of an imine of Formula (I) to an amine of Formula (II):



wherein

$R^1$  is selected from the group consisting of aryl and heteroaryl, which two groups are optionally substituted;

$R^2$  is selected from the group consisting of hydrogen, aryl, heteroaryl,  $C_{1-10}$ alkyl,  $C_{2-10}$ alkenyl,  $C_{2-10}$ alkynyl,  $C_{3-10}$ cycloalkyl,  $C_{3-10}$ cycloalkenyl and  $C_{3-10}$ heterocyclo, which latter eight groups are optionally substituted; and

$R^3$  is selected from the group consisting of optionally substituted  $C_1$  to  $C_2$  alkyl and optionally substituted  $C_{3-10}$ cycloalkyl;

or  $R^1$  and  $R^2$  or  $R^2$  and  $R^3$  are linked to form an optionally substituted ring; wherein the optional substituents of  $R^1$  and  $R^2$  are independently selected from one or more of the group consisting of halo,  $NO_2$ ,  $OR^4$ ,  $NR^4_2$  and  $R^4$ , in which  $R^4$  is independently selected from one or more of the group consisting of hydrogen, aryl,

C<sub>1-6</sub>alkyl, C<sub>2-6</sub>alkenyl, C<sub>3-6</sub>cycloalkyl and C<sub>3-6</sub>cycloalkenyl;

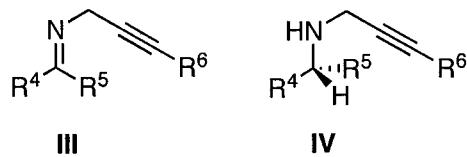
$R^1$  is selected from the group consisting of aryl and heteroaryl, which two groups are optionally substituted;

R<sup>2</sup> is selected from the group consisting of hydrogen, aryl, heteroaryl, C<sub>1-10</sub>alkyl, C<sub>2-10</sub>alkenyl, C<sub>2-10</sub>alkynyl, C<sub>3-10</sub>cycloalkyl, C<sub>3-10</sub>cycloalkenyl and C<sub>3-10</sub>heterocyclo, which latter eight groups are optionally substituted; and

R<sup>3</sup> is selected from the group consisting of optionally substituted C<sub>1</sub> to C<sub>2</sub> alkyl and optionally substituted C<sub>3-10</sub>cycloalkyl;

or R<sup>1</sup> and R<sup>2</sup> or R<sup>2</sup> and R<sup>3</sup> are linked to form an optionally substituted ring; wherein the optional substituents of R<sup>1</sup> and R<sup>2</sup> are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OR<sup>4</sup>, NR<sup>4</sup><sub>2</sub> and R<sup>4</sup>, in which R<sup>4</sup> is independently selected from one or more of the group consisting of hydrogen, aryl, C<sub>1-6</sub>alkyl, C<sub>2-6</sub>alkenyl, C<sub>3-6</sub>cycloalkyl and C<sub>3-6</sub>cycloalkenyl;

2. (Original) A process for the hydrogenation and/or asymmetric hydrogenation of an imine of Formula (III) to an amine of Formula (IV):



wherein

R<sup>4</sup> and R<sup>5</sup> represent simultaneously or independently hydrogen, aryl, heteroaryl, C<sub>1-10</sub>alkyl, C<sub>2-10</sub>alkenyl, C<sub>2-10</sub>alkynyl, C<sub>3-10</sub>cycloalkyl, C<sub>3-10</sub>cycloalkenyl or C<sub>3-10</sub>heterocyclo, which latter eight groups are optionally substituted, or

R<sup>4</sup> and R<sup>5</sup> are linked together to form an optionally substituted ring;

R<sup>6</sup> is selected from the group consisting of H, aryl, C<sub>1-10</sub>alkyl, C<sub>2-10</sub>alkenyl, C<sub>2-10</sub>alkynyl, C<sub>3-10</sub>cycloalkyl and C<sub>3-10</sub>cycloalkenyl, which latter six groups are optionally substituted; wherein the optional substituents of R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OR<sup>7</sup>, NR<sup>7</sup><sub>2</sub> and R<sup>7</sup>, in which R<sup>7</sup> is independently selected from the group consisting of C<sub>1-6</sub>alkyl, C<sub>2-6</sub>alkenyl and C<sub>2-6</sub>alkynyl; and

one or more of the carbon atoms in the alkyl, alkenyl and/or alkynyl groups of R<sup>4</sup>, R<sup>5</sup> and/or R<sup>6</sup> are optionally replaced with a heteroatom selected from the group consisting

of O, S, N, P and Si, which, where possible, is optionally substituted with one or more C<sub>1</sub>-<sub>6</sub>alkyl groups,

said process comprising the steps of reacting imines of Formula (III) in the presence of H<sub>2</sub>, and a catalytic system in which the catalytic system includes a base and a ruthenium complex comprising (1) a diamine and (2) a diphosphine ligand or monodentate phosphine ligands.

3. (Original) The process according to claim 1, wherein the amine of Formula (II) or its opposite enantiomer, is produced in enantiomerically enriched form.

4. (Original) The process according to claim 2, wherein the amine of Formula (IV) or its opposite enantiomer, is produced in enantiomerically enriched form.

5. (Currently Amended) The process according to claim 1 or 3, wherein R<sup>1</sup> is optionally substituted aryl.

6. (Original) The process according to claim 5, wherein R<sup>1</sup> is optionally substituted phenyl,

7. (Original) The process according to claim 6, wherein R<sup>1</sup> is unsubstituted phenyl.

8. (Currently Amended) The process according to any one of claim[[s]] 5[[7]], wherein R<sup>2</sup> is selected from the group consisting of hydrogen, aryl, C<sub>1</sub>-<sub>6</sub>alkyl, C<sub>2</sub>-<sub>6</sub>alkenyl, C<sub>2</sub>-<sub>6</sub>alkynyl, C<sub>3</sub>-<sub>6</sub>cycloalkyl and C<sub>3</sub>-<sub>6</sub>cycloalkenyl, which latter six groups are optionally substituted.

9. (Original) The process according to claim 8, wherein R<sup>2</sup> is selected from the group consisting of hydrogen, aryl and C<sub>1</sub>-<sub>6</sub>alkyl, which latter two groups are optionally substituted.

10. (Original) The process according to claim 9, wherein R<sup>2</sup> is selected from the group consisting of hydrogen, phenyl, and C<sub>1</sub>-<sub>6</sub>alkyl, which latter two groups are optionally substituted.

11. (Original) The process according to claim 10, wherein R<sup>2</sup> is selected from the group consisting of hydrogen, unsubstituted phenyl and methyl.

12. (Currently Amended) The process according to ~~any one of~~ claim[[s]] 5[[11]], wherein R<sup>3</sup> is selected from the group consisting of optionally substituted C<sub>1</sub> to C<sub>2</sub> alkyl and optionally substituted C<sub>3-6</sub>cycloalkyl.

13. (Original) The process according to claim 12, wherein R<sup>3</sup> is methyl, ethyl, i-propyl, cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl, which latter four groups are unsubstituted.

14. (Currently Amended) The process according to claim[[s]] 1 or 3, wherein R<sup>2</sup> and R<sup>3</sup>, including the atoms to which they are attached, are linked to form an optionally substituted 5- or 6-membered ring.

15. (Original) The process according to claim 14, wherein R<sup>2</sup> and R<sup>3</sup>, including the atoms to which they are attached, are linked to form an unsubstituted 5- or 6-membered ring.

16. (Currently Amended) The process according to ~~any one of~~ claim[[s]] 5[[15]], wherein the optional substituents for R<sup>1</sup> and R<sup>2</sup> in the compounds of Formula I, are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OR<sup>4</sup>, NR<sup>4</sup><sub>2</sub> and R<sup>4</sup>, in which R<sup>4</sup> is independently selected from one or more of the group consisting of hydrogen, aryl and C<sub>1-4</sub>alkyl, and the optional substituents of R<sup>3</sup> are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OR<sup>5</sup>, NR<sup>5</sup><sub>2</sub> and R<sup>5</sup>, in which R<sup>5</sup> is independently selected from the group consisting of C<sub>1-4</sub>alkyl.

17. (Original) The process according to claim 16, wherein the optional substituents for R<sup>1</sup> and R<sup>2</sup> in the compounds of Formula I, are independently selected from one or more of

the group consisting of halo, NO<sub>2</sub>, OH, OCH<sub>3</sub>, NH<sub>2</sub>, N(CH<sub>3</sub>)<sub>2</sub>, CH<sub>3</sub> and phenyl and the optional substituents of R<sup>3</sup> are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OH, OCH<sub>3</sub>, NH<sub>2</sub>, N(CH<sub>3</sub>)<sub>2</sub> and CH<sub>3</sub>.

18. (Currently Amended) The process according to ~~any one of claim[[s]] 5[[-17]]~~, wherein one to three of the carbon atoms in the alkyl, alkenyl and/or alkynyl groups of R<sup>1</sup>, R<sup>2</sup> and/or R<sup>3</sup> is optionally replaced with a heteroatom selected from the group consisting of O, S, N, NH and N-CH<sub>3</sub>.

19. (Original) The process according to claim 18, wherein suitably one of the carbon atoms in the alkyl, alkenyl and/or alkynyl groups of R<sup>1</sup>, R<sup>2</sup> and/or R<sup>3</sup> is optionally replaced with a heteroatom selected from the group consisting of O, S, N, NH and N-CH<sub>3</sub>.

20. (Currently Amended) The process according to claim 2 or 4, wherein R<sup>4</sup> and R<sup>5</sup> represent simultaneously or independently hydrogen, aryl, C<sub>1-6</sub>alkyl, C<sub>2-6</sub>alkenyl, C<sub>2-6</sub>alkynyl, C<sub>3-6</sub>cycloalkyl or C<sub>3-6</sub>cycloalkenyl, which latter six groups are optionally substituted.

21. (Original) The process according to claim 20, wherein R<sup>4</sup> and R<sup>5</sup> represent simultaneously or independently hydrogen, aryl or C<sub>1-6</sub>alkyl, which latter two groups are optionally substituted.

22. (Original) The process according to claim 21, wherein R<sup>4</sup> and R<sup>5</sup> represent simultaneously or independently hydrogen, phenyl, and C<sub>1-6</sub>alkyl, which latter two groups are optionally substituted.

23. (Original) The process according to claim 22, wherein R<sup>4</sup> and R<sup>5</sup> represent simultaneously or independently hydrogen, unsubstituted phenyl or methyl.

24. (Currently Amended) The process according to claim 2 or claim 4, wherein R<sup>4</sup> and R<sup>5</sup>, including the atoms to which they are attached, are linked to form an optionally substituted, suitably unsubstituted, 5- or 6-membered ring.

25. (Currently Amended) The process according to any one of claim[[s]] 20[[-24]], wherein R<sup>6</sup> is selected from the group consisting of H, aryl, C<sub>1-6</sub>alkyl, C<sub>2-6</sub>alkenyl, C<sub>2-6</sub>alkynyl, C<sub>3-6</sub>cycloalkyl and C<sub>3-6</sub>cycloalkenyl, which latter six groups are optionally substituted.

26. (Original) The process according to claim 25, wherein R<sup>6</sup> is selected from the group consisting of H and C<sub>1-4</sub>alkyl.

27. (Original) The process according to claim 26, wherein R<sup>6</sup> is H.

28. (Currently Amended) The process according to any one of claim[[s]] 20[[-27]], wherein the optional substituents for R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup>, are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OR<sup>7</sup>, NR<sup>7</sup><sub>2</sub> and R<sup>7</sup>, in which R<sup>7</sup> is independently selected from one or more of the group consisting of C<sub>1-4</sub>alkyl.

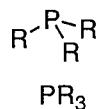
29. (Original) The process according to claim 28, wherein the optional substituents for R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> in the compounds of Formula III, are independently selected from one or more of the group consisting of halo, NO<sub>2</sub>, OH, OCH<sub>3</sub>, NH<sub>2</sub>, N(CH<sub>3</sub>)<sub>2</sub> and CH<sub>3</sub>,

30. (Currently Amended) The process according to any one of claim[[s]] 20[[-29]], wherein one to three, of the carbon atoms in the alkyl, alkenyl and/or alkynyl groups of R<sup>4</sup>, R<sup>5</sup> and/or R<sup>6</sup> is optionally replaced with a heteroatom selected from the group consisting of O, S, N, NH and N-CH<sub>3</sub>.

31. (Original) The process according to claim 30, wherein one of the carbon atoms in the alkyl, alkenyl and/or alkynyl groups of R<sup>4</sup>, R<sup>5</sup> and/or R<sup>6</sup> is optionally replaced with a heteroatom selected from the group consisting of O, S, N, NH and N-CH<sub>3</sub>.

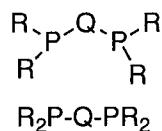
32. (Currently Amended) The process according to any one of claim[[s]] 1 to 31, wherein said ruthenium complex has the general Formula  $\text{RuXY}(\text{PR}_3)_2(\text{NH}_2\text{-Z-NH}_2)$  (III) or  $\text{RuXY}(\text{R}_2\text{P-Q-PR}_2)(\text{NH}_2\text{-Z-NH}_2)$  (IV), where Z and Q represent a chiral or achiral linker; the ancillary ligands  $\text{PR}_3$  and  $\text{R}_2\text{P-Q-PR}_2$  represent monodentate and bidentate phosphines, respectively; and the ligands X and Y represent an anionic ligand.

33. (Original) The process according to claim 32, wherein the ligand  $\text{PR}_3$ :



represents a chiral or achiral monodentate phosphine ligand in which R is simultaneously or independently selected from the group consisting of optionally substituted linear and branched alkyl containing 1 to 8 carbon atoms, optionally substituted linear and branched alkenyl containing 2 to 8 carbon atoms, optionally substituted cycloalkyl, optionally substituted aryl, OR and  $\text{NR}_2$ ; or two R groups bonded to the same P atom are bonded together to form a ring having 5 to 8 atoms and including the phosphorous atom to which said R groups are bonded.

34. (Original) The process according to claim 32, wherein the ligand  $\text{R}_2\text{P-Q-PR}_2$ :



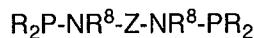
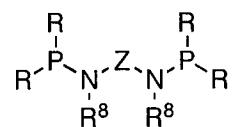
represents a bidentate ligand in which R is simultaneously or independently selected from the group consisting of optionally substituted linear and branched alkyl containing 1 to 8 carbon atoms, optionally substituted linear and branched alkenyl containing 2 to 8 carbon atoms, optionally substituted cycloalkyl, optionally substituted aryl, OR and  $\text{NR}_2$ ; or two R groups bonded to the same P atom are bonded together to form a ring having 5 to 8 atoms and including the phosphorous atom to which said R groups are bonded;

and Q is selected from the group consisting of linear and cyclic C<sub>2</sub>-C<sub>7</sub> alkylene, optionally substituted metallocenediyl and optionally substituted C<sub>6</sub>-C<sub>22</sub> arylene.

35. (Original) The process according to claim 34, wherein the ligand R<sub>2</sub>P-Q-PR<sub>2</sub> is chiral and includes atropisomeric bis-tertiary phosphines, in which the two phosphorus atoms are linked by a biaryl backbone.

36. (Original) The process according to claim 35, wherein the ligand R<sub>2</sub>P-Q-PR<sub>2</sub> is selected from the group consisting of BINAP, BIPHEP and BIPHEMP.

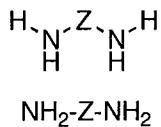
37. (Original) The process according to claim 32, wherein the bidentate phosphine is a chiral or achiral ligand of the type R<sub>2</sub>P-NR<sup>8</sup>-Z-NR<sup>8</sup>-PR<sub>2</sub>:



wherein each R, taken separately, is independently selected from the group consisting of optionally substituted linear and branched alkyl containing 1 to 8 carbon atoms, optionally substituted linear and branched alkenyl containing 2 to 8 carbon atoms, optionally substituted cycloalkyl, optionally substituted aryl, OR and NR<sub>2</sub>; or two R groups bonded to the same P atom are bonded together to form a ring having 5 to 8 atoms and including the phosphorous atom to which said R groups are bonded; each R<sup>8</sup>, taken separately, is independently selected from the group consisting of hydrogen, optionally substituted linear and branched alkyl and alkenyl containing 1 to 8 carbon atoms, optionally substituted cycloalkyl, optionally substituted aryl, OR and NR<sub>2</sub>; and Z is optionally substituted linear and cyclic C<sub>2</sub>-C<sub>7</sub> alkylene, optionally substituted metallocenediyl and optionally substituted C<sub>6</sub>-C<sub>22</sub> arylene.

38. (Original) The process according to claim 37, wherein the ligand R<sub>2</sub>P-NR<sup>8</sup>-Z-NR<sup>8</sup>-PR<sub>2</sub> is selected from the group consisting of DPPACH and DCYPPACH.

39. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 38~~, wherein the diamine ligand has the Formula  $\text{NH}_2\text{-Z-NH}_2$ :



wherein Z is selected from the group consisting of optionally substituted linear and cyclic  $\text{C}_2\text{-C}_7$  alkylene, optionally substituted metallocenediyl and optionally substituted  $\text{C}_6\text{-C}_{22}$  arylene.

40. (Original) The process according to claim 39, wherein the diamine ligand is chiral and includes (1) compounds in which at least one of the amine-bearing centers is stereogenic, (2) compounds in which both of the amine-bearing centers are stereogenic and (3) atropisomeric bis-tertiary diamines, in which the two nitrogen atoms are linked by a biaryl backbone.

41. (Original) The process according to claim 39, wherein the diamine ligand  $\text{NH}_2\text{-Z-NH}_2$  is selected from the group consisting of CYDN and DPEN.

42. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 38~~, wherein the diamine is a bidentate ligand of the Formula  $\text{D-Z-NHR}^9$  in which Z is selected from the group consisting of optionally substituted linear and cyclic  $\text{C}_2\text{-C}_7$  alkylene, optionally substituted metallocenediyl and optionally substituted  $\text{C}_6\text{-C}_{22}$  arylene; D is an amido group donor or a chalcogenide radical selected from the group consisting of O, S, Se and Te;  $\text{NHR}^6$  is an amino group donor in which  $\text{R}^9$  is selected from the group consisting of hydrogen, optionally substituted linear and branched alkyl and alkenyl containing 1 to 8 carbon atoms, optionally substituted cycloalkyl and optionally substituted aryl.

43. (Original) The process according to claim 42, wherein D is NR<sup>10</sup>, wherein R<sup>10</sup> is selected from the group consisting of S(O)<sub>2</sub>R<sup>10</sup>, P(O)(R<sup>10</sup>)<sub>2</sub>, C(O)R<sup>10</sup>, C(O)N(R<sup>10</sup>)<sub>2</sub> and C(S)N(R<sup>10</sup>)<sub>2</sub>, in which R<sup>10</sup> is independently selected from the group consisting of hydrogen, optionally substituted linear and branched alkyl and alkenyl containing 1 to 8 carbon atoms, optionally substituted cycloalkyl and optionally substituted aryl.

44. (Original) The process according to claim 42, wherein the diamine is chiral and includes (1) compounds in which the amine-bearing center is stereogenic, (2) compounds in which both the donor-bearing (D) and amine-bearing centers are stereogenic.

45. (Original) The process according to claim 44, wherein the diamine is CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>NCHPhCHPhNH<sub>2</sub>.

46. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 45~~, wherein the ligands X and Y is selected from the group consisting of Cl, Br, I, H, hydroxy, alkoxy and acyloxy.

47. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 46~~, wherein the base is an alcoholate or an hydroxide salt selected from the group consisting of compounds of the Formula (R<sup>12</sup>O)<sub>2</sub>M' and R<sup>12</sup>OM'', in which M' is an alkaline-earth metal, M'' is an alkaline metal and R<sup>12</sup> is selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> linear and branched alkyl.

48. (Currently Amended) The process according to ~~any one of claim[[s]] 1[-47]~~, wherein the base is an organic non-coordinating base.

49. (Original) The process according to claim 48, wherein the base is selected from the group consisting of DBU, NR<sub>3</sub> and phosphazene.

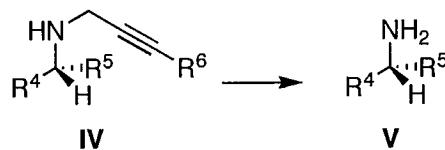
50. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 49~~, wherein the hydrogenation is carried out in the absence of a solvent.

51. (Currently Amended) The process according to ~~any one of claim[[s]] 1 to 49~~, wherein the hydrogenation reaction is carried out in the presence of a solvent.

52. (Original) The process according to claim 51, wherein the solvent is selected from the group consisting of benzene, toluene, xylene, hexane, cyclohexane, tetrahydrofuran, primary and secondary alcohols, and mixtures thereof.

53. (Original) The process according to claim 51, wherein the hydrogenation is carried out in an amine solvent.

54. (Currently Amended) A process for the preparation of amines of Formula V from the amine of the Formula IV, or the opposite enantiomer thereof:



wherein R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are as defined in ~~any one of claim[[s]] 2, 4 and 20-31~~, comprising reacting compounds of Formula IV under conditions for the selective removal of the CH<sub>2</sub>-C≡C-R<sup>6</sup> group.

55. (Original) The process according to claim 54, wherein the conditions for the selective removal of the CH<sub>2</sub>-C≡C-R<sup>6</sup> group comprise TiCl<sub>3</sub> and lithium.

56. (Currently Amended) The process according to claim 54 or ~~55~~ wherein the compound of Formula IV is enantiomerically enriched.